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M P Williams 210 Main Street Manchester, CT 06040			EXAMINER ZHENG, LOIS L	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## **DETAILED ACTION**

### ***Status of Claims***

1. No claim amendments are made in view of applicant's reply filed 2 November 2006. Therefore, claims 1-14 and 17-19 remain currently under examination.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States, before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 6-10 and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Taniguchi et al. US 6,083,638(Taniguchi).

The teachings of Taniguchi are discussed in paragraph 3 of the previous Non-Final Office Action mailed 7 June 2006. The rejection grounds of the instant claims 1-2, 6-10 and 13-14 are maintained for the same reasons as stated in the previous Non-Final Office Action.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-7, 10-12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. US 6,083,638(Taniguchi) in view of Lindstrom US 4,647,359(Lindstrom).

The teachings of Taniguchi in view of Lindstrom are discussed in paragraph 5 of the previous Non-Final Office Action mailed 7 June 2006. The rejection grounds of the instant claims 3-7, 10-12 and 19 are maintained for the same reasons as stated in the previous Non-Final Office Action.

6. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi, and in view of Fuglevand et al. US 6,030,718(Fuglevand).

The teachings of Taniguchi in view of Fuglevand are discussed in paragraph 6 of the previous Non-Final Office Action mailed 7 June 2006. The rejection grounds of the instant claims 17-18 are maintained for the same reasons as stated in the previous Non-Final Office Action.

### ***Response to Arguments***

7. The declaration under 37 CFR 1.132 filed 2 November 2006 is insufficient to overcome the rejection of claims 1-14 and 17-19 based upon Taniguchi, or Taniguchi in view of Lindstrom, or Taniguchi in view of Fuglevand as set forth in the last Office action.

In paragraphs 5-9 of the declaration, applicant argues that that Taniguchi teaches a single layer with areas of hydrophilic and hydrophobic material, wherein the hydrophilic and hydrophobic layer is built on a substrate material. Therefore, the single

layer as taught by Taniguchi is not the same as the claimed bi-layer for increasing capacitance of the cell.

The examiner does not find applicant's argument persuasive. Applicant insists that the Taniguchi only teaches a single layer of hydrophilic and hydrophobic material, which seems to imply that the instantly claimed bi-layer is a two-layer system with hydrophilic and hydrophobic material. However, the instant specification discloses that the bi-layer includes a hydrophobic phase and a hydrophilic phase providing integrated passages through out the bi-layer(col. 5 lines 42-46, col. 6 lines 24-50). Therefore, the bi-layer of the instant claims 1 and 8 is a single layer with areas of hydrophobic and hydrophilic materials and Taniguchi's single layer two-phase porous plate meets the description of bi-layer as recited in the instant specification.

With respect to the ability to increase cell capacitance, the examiner maintains that the two-phase porous support layer as taught by Taniguchi is inherently capable of increasing capacitance of the cell as claimed. In addition, it is well settled that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). See MPEP 2114. Furthermore, the language "for increasing capacitance of the cell" as recited in claims 1 and 8 can be interpreted as intended use for the instantly claimed porous support plate. However, this intended use

language does not include or imply any structure limitations that differentiate the instantly claimed apparatus from the apparatus of Taniguchi, therefore, does not lend patentability to the instant apparatus claims.

Applicant further argues that Taniguchi does not teach the claimed porous substrate layer. Applicant discusses the pore sizes of the bi-layer and the porous substrate layer of the instant invention.

The examiner does not find applicant's argument persuasive. Taniguchi teaches, in another embodiment, that the two-phase porous plate can be formed by "letting hydrophilic resin to adhere to a porous substrate" and then "letting hydrophobic resin to adhere partially to the hydrophilic layers"(col. 13 lines 35-41). Therefore, Taniguchi clearly teach the claimed porous substrate layer. With respect to discussion of the different pore sizes in the bi-layer and the porous substrate layer, the examiner does not consider that this discussion affects the patentability of the instantly claimed apparatus since pore sizes of the bi-layer and the porous substrate layer are not claimed subject matter.

Applicant further argues that Fuglevand cannot be combined with Taniguchi since Fuglevand's diffusion layer 171 having a hydrophobic gradient will result in a hydrophobic layer that would obstructing the water flow paths in Taniguchi. Applicant also argues that Fuglevand does not teach a hydrophilic substrate layer.

The examiner does not find applicant's arguments persuasive. Fuglevand teaches that its diffusion layer 171 is a composite material formed of successive layers of material with different hydrophobicity, thereby creating a hydrophobic gradient(col. 10

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lines 59 – 65). Each layer of this composite material is made of a mixture of hydrophobic and hydrophilic binding resins(col. 10 line 65 – col. 11 line 5). With decreasing hydrophobicity, the amount of hydrophilic resin used increases. Each layer of the composite with increasing amount of hydrophilic resin(i.e. lower hydrophobicity) would inherently have a increasing hydrophilicity. Fuglevand further teaches that the first layer “closest to the porous carbon backing layer may be the most hydrophilic layer”(col. 11 lines 5-11). Therefore, a layer of composite further way from the MEA assembly as taught by Fuglevand reads on the claimed hydrophilic layer and a layer of composite that is closer to the MEA layer with higher hydrophobicity as taught by Fuglevand reads on the claimed partially hydrophobic bi-layer.

In addition, Fuglevand only teaches a hydrophobic gradient in its composite layer and does not teach that the most hydrophobic layer is 100% hydrophobic. Furthermore, Fuglevand mentions that its composite diffusion layer allows sufficient water to escape from the cathode side of the MEA(col. 11 lines 28-31). Therefore, when incorporating the composite diffusion layer of Fuglevand into the apparatus of Taniguchi to substitute the two-phase porous support plates, the resulting composite diffusion layer would not obstructing the water flow path as alleged by the applicant.

Lastly, Fuglevand also provides a proper motivation for incorporating its composite diffusion layer with hydrophobic gradient, which is to “facilitate the retention of sufficient moisture ... such that it achieves substantially the maximum current density possible without the addition of extra moisture or humidification from the outside of the PEM fuel cell module”.

Therefore, the examiner maintains that the combination of Taniguchi and Fuglevand is proper.

8. Applicant's arguments filed 2 November 2006 have been fully considered but they are not persuasive.

Applicant's arguments are based on the discussion in the declaration under 38 CFR 1.132 filed 2 November 2006. Since this declaration is not sufficient to overcome the outstanding rejection grounds, applicant's arguments are also considered insufficient.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LLZ

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